REMARKS

A drawing correction request has been made to amend Figures 2, 4, and 5. Claims 1, 4, 5, 9, 11-14, 17, and 20 have been amended. New claims 21-26 are added. Claims 2, 3, 6, 7, 15, and 16 are canceled. Original claims 8, 10, and 18-19 remain in the application.

Reexamination and reconsideration of the application, as amended, are requested.

Drawings

Figure 2 is amended to add the micro-controller unit 32 as an integral component of the child car seat as claimed in original claim 3 as "said controller unit being installed on said child car seat by attaching means," and on page 9, beginning at line 30, as "a controller unit 32 that is added in the vehicle 12 in close proximity or on the child car seat 16." Further, cushion switch cable 42, which connects to the controller unit, is shown accordingly along with the vehicle cable harness 60, which connects other vehicle components to the controller unit.

Figures 3 and 4 are amended to change the term "controller" to micro-controller" to be consistent throughout the application. The term controller and micro-controller were interchangeable used in the original application; "controller" being used in multiple instances, such as page 8, line 13 and "micro-controller(s)" being used on page 10, line 10 and page 11, line 14. It would been obvious to one having ordinary skill in the art at the time of the invention

was made that a micro-controller could be used to generate the control functions specified in the flow diagram of Figure 8.

Specifications

The term "controller unit" has been changed to "micro-controller unit" throughout the specification and abstract to be consistent with the intent of the term as illustrated on page 10, line10 and page 11, line 14 of the original application.

In the brief description of drawings, Figure 2 on page 7, line 13 is amended to add the term "and micro-controller" to be consistent with the above mentioned Figure 2 drawing amendment.

The detailed description of Figure 2 on page 8, line 17 is amended to include "a micro-controller unit 32" as stated in the last phrase of original claim 3 as "said controller unit being installed on said child car seat by attaching means." The Figure 2 description on page 8, line 17 is further amended to add a cushion switch cable 42 "coupled to the micro-controller unit 32, and a cable harness 60 for connecting the system to other input/output components in the vehicle" since the cable harness 60 routes between the controller unit 32 and sensor and alarm functions in a vehicle.

To further clarify that the micro-controller unit controls the vehicle occupant detection and

notification system according to the flow diagram of Figure 8, the description of Figure 8 is amended on page 10, line 18, by adding the sentence "The micro-controller unit of the present invention is programmed to carry out the functions in this flow diagram."

Claim Rejections – 35 USC § 103

In the Official Action, Claims 1-20 stand rejected under 35 U.S.C. 1 03(a) as being unpatentable over Osborne [US. 2004/0113797] in view of Takada [US 4,979,777].

2. The Official Office Action that Regarding claim 1, **Osborne** discloses a child car seat assembly, comprising: a child car seat 28 (fig. 1) being attachable in a seat 24 of a vehicle; a seat cushion 82 (fig. 8) with pressure switch 84 formed in the seating area of the child car seat; the pressure switch being enabled when a child occupies the child seat; and signal wires 86 from the pressure switch routed out of said seat cushion for connecting to a vehicle ,occupant detection and notification system for use in notifying a person that a child is strapped in said child car seat (figs. 1 and 8; [0036], [0051]).

Also that **Osborne** does not specify the child car seat having a safety belt for securing the child, however it would have been obvious to one having ordinary skill in the art at the time the invention was made the safety belt in a car is required by law in most countries for safety reason, including the safety belt for the child car seat as shown by **Tanaka** (8, 11, 13; fig. 2 and 4; col. 2, lines 49-65).

Response:

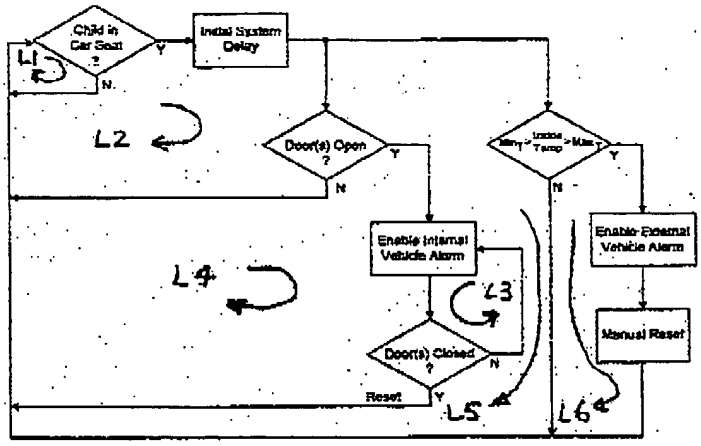
Original Claim 3 is canceled and added in an amendment to Claim 1, thereby making the micro-controller unit an integral part of the child car seat assembly. Claim 1 is further amended to add "said micro-controller unit being operable to monitor said micro-controller unit's inputs from said seat cushion and other sensor inputs of said vehicle detection and notification system and to provide output enabling signals to internal and external vehicle alarms," as shown in the block diagram of Figure 5 and pointed out in the description of Figure 5 of the present invention on page 9, lines 21-24, which reads "here the cushion pressure switch 30, door switches 22-28, inside temperature sensor 38, and vehicle power supply 46 are shown coupled to inputs of the micro-controller unit 32. Outputs from the micro-controller unit 32 are then coupled to the internal vehicle alarm 34 and the external vehicle alarm 36."

By adding the micro-controller unit to the child car seat assembly of claim 1 (as claimed in the original claim 3 and stated in the original application on page 9, line 30 and page 10, line 1; "to a controller unit 32, that is added in the vehicle 12 in close proximity or on the child car seat 16") the child car seat assembly is now comprised of a child car seat, a seat cushion, signal wires to various other sensors, a power source, and a micro-controller unit for controlling the system, and enabling the internal and external alarms. The addition of the micro-controller unit to the assembly makes the assembly different in structure and unique relative to the Osborne patent, since Osborne does not disclose a micro-controller unit of the structure or function disclosed in the present invention, but rather a detectable signal generator, which is specifically defined in Osborne claim 3 and on page 1 [0012] as "the detectable signal generator comprises at

least one of a) a sound generator; b) an illumination source; c) a visual display: d) a mechanical assembly that is capable of changing state; and e) a horn." These are all displays, alarms, and other indicators, which are not micro-controllers and do not appear to have any control capability. In comparison, the micro-controller unit of the present invention fully controls all functions of the child car seat assembly according to the flow diagram of Figure 8 and as described in the detailed description of Figure 8 beginning on page 10, line 17 of the original application.

It is well known in the electronic and semiconductor industries that micro-controllers are integrated circuit (IC) chips and/or hybrid modules fabricated from smaller surface mounted IC chips that can be used to control the operation of various apparatus. These micro-controllers typically operate at speeds of at least 20 MHz, have random access memory (RAM), scratch pad memory, erasable EPROM memory for storing software programming code, 16 to 32 input/output (I/O) pins, a windows text editor for use in developing the software code for controlling a particular application, can process at least 12,000 instructions/sec, and have the capability of polling or monitoring the state of each input many times each millisecond. There are numerous classes of these micro-controllers available, for example the reduction-to-practice model of the present invention uses a Parallax BS2p24 Stamp module with 16 I/O pins to monitor inputs from the car seat pressure switch, one-to-four door switches, and a temperature sensor and to provide output control signals to a voice generator or internal alarm and to a high volume external alarm. This particular chip is programmed using PBasic code. In the present invention, operational changes are made simply by changing the software code.

The Applicant submits that the micro-controller is a well known method of controlling electronic functions and that the flow diagram of Figure 8 being implemented using this approach is different in structure and therefore unique with respect to the Osborne patent. For clarification purposes, the flow diagram of Figure 8 is repeated below with control loops L1 – L6 added for discussion purposes. The micro-controller unit of the present invention, polls or monitors all input pins at least 100s of times each second. If there is not a child in the child car seat, the system remains in loop L1 in a standby mode. Once the micro-controller unit determines that a child has been placed in the child car seat, the control function switches to loop L2 where a delay time is implemented to allow responsible vehicle occupants to enter the vehicle without setting off any of the alarms. Next, the control function enters loop L3 where as long as a child is in the child car seat and none of the monitored doors are open, nothing happens. As soon as one of the monitored doors is opened, normally indicating that the vehicle has reached its destination and is being vacated, a voice message (example: "remember, child onboard") is announced or an internal alarm is sounded and the control function enters control loop L4 where if the child is removed from the child car seat, the system is reset. However, if the child is not removed from the child car seat then the control function moves to loop L5 where the internal temperature inside the vehicle is monitored. If the inside vehicle temperature reaches extreme levels, above or below preset values, the control function switches to loop L6 where a loud external alarm is sounded until help arrives to rescue the child from the child car seat and the system is reset.



The safety belt claimed by Tanaka and claim 1 of the present application is not the critical item in claim 1 of the present application, however it is an important and necessary item in the unique combination disclosed in the child car seat assembly of the present invention for safety reasons and to satisfy requirements of the law as pointed out in the Official Action.

Regarding claim 2, **Osborne** discloses that the seat cushion is a removable cushion with built-in pressure switch for retrofitting in an existing child car seat (seat cushion may be placed on the child seat or front or rear seat of the vehicle [0051]); the attaching of the cushion to the seat is obvious for the child safety reason.

Response:

Claim 2 is canceled since existing child car seats would not have a built-in micro-

controller unit.

Regarding claim 3, **Osborne** discloses the assembly comprising a controller unit 94 (fig. 1) for controlling the vehicle occupant detection and notification system (the monitoring system can be permanently retrofitted into the vehicle or can be portable, self-contained, and removable, [0053]).

Response:

Claim 3 is canceled and added to claim 1. However, as discussed above in the Claim 1 response, the Osborne disclosure does not appear to include a micro-controller unit, but rather a set of indicators that are directly enabled by various sensors.

Regarding claims 4 and 12, **Osborne** and **Takada** disclose a vehicle occupant detection and notification system and a vehicle with child detection and notification system for use in combination with a child car seat (the cushion with incorporated pressure sensor can be placed in a child seat or any car seat [0051] and the monitoring system can be portable [0053]), comprising:

a child car seat (Osborne; fig. 1) being attachable to a seat of a vehicle, having a safety belt for securing a child (Tanaka, fig. 1), and having a built-in seat cushion pressure switch enabled when a child occupies the child car seat (sensing system 40 figs. 1 and 8; [0036]-[0037]);

a controller unit mountable in the vehicle to determine when a child is in the child car seat and a passenger door of said vehicle is open (Osborne; detectable signal generator 44; fig. 6; claim 1 c);

a door switch mountable on the driver's door of the vehicle, a signal wire from the door switch being routable to an input of the controller unit for indicating when said door is open (Osborne; exit sensor 48; [0041]);

an internal vehicle alarm being enabled by an output signal from the controller unit for reminding responsible occupants of the vehicle, when a child is in the child car seat and a door of the vehicle is opened (Osborne; claim1 c and claim 3; fig. 7; [0047]); and

a wiring harness for routing signal wires from the seat cushion pressure switch 40, the door switches 48, the vehicle's power and chassis ground to inputs of the controller unit 44 and further routing an output signal wire from the controller unit 44 to the internal vehicle alarm (Osborne; figs. 1 and 7); the mating connector for coupling the wiring harness to the pressure switch and the controller unit is inherent since the system is a removable system.

Response:

Regarding claim 4, claims 6 and 7 are canceled and added to claim 4, thereby adding an inside temperature sensor and a high volume audible external alarm to claim 4.

Similarly, regarding claim 12, claims 15 and 16 are canceled and added to claim 12, thereby adding an inside temperature sensor and a high volume audible external alarm to claim 12.

Again, as discussed in claim 1, the Applicant submits that the present invention is unique relative to Osborne since the Osborne method and/or system does not claim a micro-controller unit of the class that is programmable and operable to control the system according to a specified operations flow diagram, but rather is a "detectable signal generator" that is comprised of a set of indicator devices, which can be directly enabled by a number of sensor types. The micro-controller unit of the present invention monitors the inputs from the seat switch, door switch, and temperature sensor at least hundreds of times a second and maintains full control of the system including the activation of a voice message module, an internal alarm, or a loud external alarm or security system as shown in system block diagram of Figure 5 and discussed in the detail description of Figure 5 on page 9, beginning at line 20 that "the cushion pressure switch 30, door switches 22-28, inside temperature sensor 38, and vehicle power supply 46 are shown coupled to inputs of the controller unit 32. Outputs from the controller unit 32 are then coupled to the internal vehicle alarm 34 and the external vehicle alarm 36."

Regarding claim 5, **Osborne** disclosed the door switches from two passenger doors (two signal wires output from exit sensors 48, fig. 1) are routed to separated inputs of the controller unit 44, the controller unit enabling the internal vehicle alarm when a child is in the seat and any of the passenger doors are opened (claim 1c and 3; fig. 7). It would have been obvious all passenger doors of the vehicle can be installed with door detection switches as designer choice or user preference.

Response:

The door switches of the present invention are inputs to the micro-controller unit, which are being continuously monitored. At least the driver's door switch has to be monitored in the present system. Whether multiple doors are monitored is determined by the specific application. However, it is the manner in which the door switch(es) are monitored by the micro-controller unit and how this data is utilized according to the direction of the system flow diagram of Figure 8 to control the system that is unique to the present invention relative to the Osborne disclosure.

Regarding claims 6 and 15, **Osborne** further discloses an inside temperature sensor 54 with its output signal being coupled to an additional input of the controller unit for determining when the temperature inside the vehicle falls above or below a predetermined temperature range (figs. 4 and 5; [0044]; claim 1a).

Response:

Claims 6 and 15 are canceled and further added to currently amended claims 4 and 12, respectively.

However, the temperature sensor of the present invention is a critical input to the micro-controller unit, which is also continuously monitored. The micro-controller chip samples the temperature input and converts the voltage to a temperature value in degrees F and compares this to the acceptable temperature range (Min_T > Inside Temp > Max_T), as illustrated in the flow diagram of Figure 8. The minimum and maximum temperatures values of the present system are

set in the software code and can easily and quickly be changed. It is the monitoring of the temperature sensor, calculation of the temperature, comparison to the min and max temperature values, and control of an alarm by the micro-controller unit, all typical functions implemented by micro-controller chips, that is unique in this phase of the flow diagram to the present invention. This appears to be different in structure from the operation of the "detectable signal generator", which is defined in Osborne claim 3 and on page 1 [0012] as "the detectable signal generator comprises at least one of a) a sound generator; b) an illumination source; c) a visual display: d) a mechanical assembly that is capable of changing state; and e) a horn." Again, these are all displays, alarms, and other indicators, which do not appear to have any control capability, but rather are enabled directly by various sensors. The micro-controller unit of the present invention is not comprised of any indicators, but rather controls the system including its indicators according to the flow diagram of Figure 8 and enables the various indicators appropriately. The Applicant submits that this is a unique difference in both the function and structure of the present invention over that of Osborne.

Regarding claims 7 and 16, **Osborne** discloses a high-volume audible external vehicle alarm (horn 54, [0046]; fig. 7) being enabled by the controller unit when a child is in the seat and the inside temperature of the vehicle is out of range. It would have been obvious the alarm cannot go on forever, it must be reset whether manually by the caregiver being notice of the alarm situation or automatically based on designer choice.

Response:

Claims 7 and 16 are cancelled and the claim for a high volume audible external alarm is further added to currently amended claims 4 and 12, respectively.

The high-volume audible external vehicle alarm is controlled by one of the micro-controller unit's outputs and is an integral part of the system, which is enabled only when the temperature is less than the Min_T or greater than the Max_T values programmed in the micro-controller. This alarm is an indicator that is enable by an output of the micro-controller and is therefore believed by Applicant to be unique to the combination of the present invention.

Regarding claims 8 and 18, **Osborne** discloses a variety of internal vehicle alarm types including voice message alarm [0047]; it would have been obvious, the beeper alarm existing in the car can be used for cost saving purpose.

Response:

In the present invention, these alarms are part of the combination of sensors and alarms being controlled by the micro-controller unit according to the flow diagram of Figure 8. The Applicant submits that this combination of micro-controller, sensors, and alarms being controlled according to the flow diagram of Figure 8 of the present invention is unique relative to Osborne.

Regarding claims 9 and 20, **Osborne** discloses the monitoring system can be integrally formed into the vehicle, or alternatively can be portable, self-contained, and removable; therefore

it would have been obvious implementing a controller unit being an integral part of the child car seat is based on designer choice [0053].

Response:

As discussed in detail above, the monitoring system disclosed by Osborne appears to be considerably different in function and structure from that of the present invention. The type of integrated micro-controllers used to control the functions of the vehicle are typical of the type disclosed in the present invention, as compared to the Osborne detectable signal generator, which is disclosed in claim 3 and on page 1 [0012] to be decisively "comprised at least one of a) a sound generator; b) an illumination source; c) a visual display: d) a mechanical assembly that is capable of changing state; and e) a horn." These are all indicators that in the normal way these are used in society do not to have any control function themselves, but in the Osborne application are apparently enabled directly by various sensors.

Regarding claims 10 and 19, **Osborne** discloses the seat cushion with built-in pressure switch is retrofitted to an existing child car seat, the cushion may be part of the child seat or may be placed on any seat in the vehicle [0051], therefore it would have been obvious one can design a separate seat cushion to be placed on any seat of choice for user convenient purpose.

Response:

The removable seat cushion of claims 10 and 19 combined with the child car seat

assembly and micro-controller unit of the present invention provides a unique combination including a retrofittable seat cushion with a built-in pressure switch, which will allow many parents with existing child car seats to retrofit and upgrade them, thereby providing protection for their children.

Regarding claims 13 and 14, **Osborne** discloses the controller unit (monitoring system) can be integrally formed into the vehicle at time of the manufacture or permanently retrofitted, or alternatively, the unit can be portable, self-contained and removable. Therefore, it would have been obvious based on designer choice, the controller unit functions can be provided by controllers of the vehicle's built-in electrical system, and the cable harness only routes a signal from the seat cushion to the controller unit [0053], fig. 1.

Response:

Both the (monitoring system) of Osborne and the micro-controller unit of the present invention could be implemented using existing components in a vehicle, thereby reducing the cost of such systems, as well as making these safety systems available to a larger portion of the population. The key difference is that the Osborne (monitoring system) consists of using only indicator devices, rather than the micro-controller of a vehicle. The Osborne patent clearly shows in FIG 7 and describes on page 3 [0046] a number of representative signals that may be generated by the detectable signal generator 44. In one form, a horn 54; conventionally operated through a button on the steering wheel 56; can function as the detectable signal generator 44 to

produce a continuous or intermittent noise," at [0047] "alternatively, the display 56 may be located on the vehicle dashboard 58, or elsewhere, to provide either a visual message at 60, or a voice message as through a speaker 62, alerting the vehicle operator of the potentially dangerous vehicle state ....", and at [0048] as a further alternative, a dedicated light 64 may be illuminated by the detectable signal generator 44. The light 64 may be a strobe light, a flashing light, etc." Also at [0049] "the detectable signal generator 44 may cause illumination, either continuously or intermittently, of one of the conventional operating lights 68 on the vehicle 10," and at [0050] "some type of mechanical device, such as a flag."

It is noted that the internal vehicle alarm, high-volume audible alarm, vehicle's security system, beeper, and voice command of the present invention are all indicators of the class defined by Osborne as the "detectable signal generator." These are not controllers, but indicators to get a persons attention. However, the integrated type of micro-controller found in modern vehicles are for the purpose of controlling the functions of the vehicle, as shown in Figure 7 and described in the descriptive paragraph at page 10, Line 6, are representative of the micro-controller unit of the present invention. As a result only signal wires from the child car seat cushion switch and the door switch(es) would need to be routed to inputs of the vehicle's existing micro-controller since the alarm devices are already a part of the automotive system controlled by the micro-controller. And in some cases the door switches may already be connected to the micro-controller as well. Then, only the software code would need to be modified to implement the control functions specified in the flow diagram of Figure 8.

Regarding claim 17, Osborne discloses the external vehicle alarm is the vehicle's existing security alarm ([0046]-[0050]).

Response:

As discussed directly above in response for claims 13 and 14, in this case the external security alarm is applied in combination with the other components, which are all being controlled by the vehicle's micro-controller to implement the control functions specified in the flow diagram of Figure 8.

3. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Osborne** and **Takada** in view of **Edwards** et al [US. 6,714,132].

Regarding claim 11, **Osborne** discloses the cushion with incorporated pressure sensor may be part of the child safety seat or may be placed upon the rear or the front seat [0051], therefore provision must be made for electrical connecting the sensor to the wiring harness where ever the cushion is placed. Osborne does not specify a plurality of child car seats however this feature is taught by Edwards et al (figs. 7A, 78, 8, 9A-9C; col. 7 line 63 through col. 11, line 50). It would have been obvious to one having ordinary skill in the art at the time the invention was made to have provision for more than one child seat in a car for the convenient of a user having than more than one child; and a wiring harness supplies signals from a plurality of child car seats can be implement into a car based on designer choice and user preference.

Response:

The claim here is that the car seat switch wires from multiple child car seats are coupled to individual inputs of the micro-controller unit of the present invention. The micro-controller units controls the system according to the flow diagram of Figure 8, monitoring all input pins so that if a child is in any of the child car seats and any of the defined conditions are met, then the appropriate alarm(s) will be enabled.

New Claims:

Claim 21; New claim 21 is added depending from independent claim 1 to claim the coupling of vehicle door switch(es) to inputs of the micro-controller unit.

Claim 22; New claim 22 is added depending from independent claim 1 to claim the coupling of a temperature sensor to an input of the micro-controller unit attached to the child car seat, as clearly stated on page 5, line3 that "an inside temperature sensor can be coupled to the micro-controller."

Claim 23; New claim 23 is added depending from independent claim 1 to claim the Markush group, which defines the alarms used in the present invention.

Claims 24-26; New claims 24-26 are added depending from independent claims 1, 4, and

12, respectively, to claim the operational functions of the system according to the flow diagram of Figure 8 and described in the detailed description on page 10, beginning at line 17.

Conclusion

4. The following prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Rice discloses a voice activated vehicle alarm system, [US. 6,028,509],

Gift et al disclose a warning system for detecting the presence of a child in an infant seat. [US. 2004/0212488],

Rackham et al disclose a smart occupant alarm system. [US. 2003/0222775],

Dulin et al disclose a hot vehicle safety system and methods of preventing passenger entrapment and heat suffocation. [US. 2002/0161501].

The above prior art made of record and not relied upon has been considered by Applicant and found to be less pertinent than the disclosures cited in the above rejections.

The Applicant further submits that the cited references do not suggest a combination that discloses the present invention in structure or function for the purpose of monitoring the status and enabling the appropriate alarms of the occupant detection and notification system as claimed in the present invention using a micro-controller unit.

The Applicant found the following case, which states that the need for the prior art references themselves to suggest that they can be combined is well known; e.g., as stated in IN re Semaker, 217 U.S.P.Q. 1, 6 (CAFC 1983):

> "[P]rior art references in combination do not make an invention obvious unless something in the prior art references would suggest the advantage to be derived from combining their teachings."

Since nowhere in the cited prior art is an occupant detection and notification system disclosed, which has the structure, including a micro-controller unit of the class disclosed in the present invention, and functional flow diagram of the present invention, the Applicant submits that the present invention is unique relative to the cited references.

In view of the above, it is submitted that claims 1, 4, 5, 8-14, and 17-26 are in condition for allowance. Reconsideration and withdrawal of the rejections are requested. Allowance of claims 1, 4, 5, 8-14, and 17-26 at an early date is solicited.

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